DIVISION OF
FIRE AND LIFE SAFETY

CITY OF SCOTTSDALE

SCOTTSDALE FIRE DEPARTMENT

Interpretations And Applications of

NFPA 13 (2007 edition)

EFFECTIVE: September 1, 2007

ORIGIN & DEVELOPMENT OF THE FIRE SPRINKLER ORDINANCE IN THE CITY OF SCOTTSDALE

The City of Scottsdale and Rural/Metro Fire Department held extensive fire sprinkler tests in 1982. The resulting tests demonstrated the reliability of listed residential quick response sprinkler heads to significantly reduce the potential for loss of life and property damage that can result from a fire.

On June 4th, 1985, the Scottsdale City Council passed an ordinance requiring all new building permits obtained for commercial and multi-family structures to be provided with an approved automatic fire sprinkler system.

New building permits obtained after January 1, 1986 for single family dwellings requires the installation of an approved automatic residential fire sprinkler system.

*Sprinklers typically reduce the chances of dying in a home fire by one half to two thirds in any kind of property where they are used. Together with smoke alarms , sprinklers cut the risk of dying in a home fire 82 percent, relative to having neither.

The Interpretations and Applications Manual describes the requirements for the installation of automatic fire sprinkler systems for the current adopted standards of NFPA 13.

For additional requirements see COS Amendments (Section 912) to the 2006 IFC at: www.scottsdaleaz.gov/codes.asp.

* NFPA Link:
http://www.nfpa.org/itemDetail.asp?categoryID=276&itemID=18249&URL=Research%20&%20Reports/Fact%20sheets/Fire%20protection%20equipment/Automatic%20sprinkler%20systems

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CITY OF SCOTTSDALE FIRE DEPARTMENT
PLANNING & DEVELOPMENT SERVICES DEPARTMENT

INTERPRETATIONS & APPLICATIONS OF THE 2007 MODIFIED NFPA 13

Revised: 09-01-07

CHAPTER 6 – SYSTEM COMPONENTS AND HARDWARE

6.9.3.1 SPRINKLER FLOW BELL REQUIREMENT *AMENDED*

The alarm unit shall be a red, listed 10 inch size electric alarm bell, located on the street side of buildings, fully visible and recognizable from the street or nearest point of fire department vehicle access or as otherwise approved by the fire code official.

CHAPTER 8 – INSTALLATION REQUIREMENTS

8.3.3.1.1 THERMAL SENSITIVITY IN TENANT IMPROVEMENTS *ADDED*

In tenant improvement spaces with existing standard response sprinkler heads, all heads within the tenant improvement space shall be changed to quick response type sprinklers when more than 50% are added or relocated, unless allowed by section 8.3.3.3. See sections 8.3.3.2 and 8.3.3.4.

8.15.7.1.1 EXTERIOR ROOFS OR CANOPIES IN EDUCATIONAL OCCUPANCIES *ADDED*

In all Group E educational occupancies sprinklers shall be installed under attached canopies exceeding 4 ft. (1.2 m) in width regardless of construction methods or materials.

8.15.7.3 (4) FLAME SPREAD RATING OF FABRIC CANOPIES *ADDED*

(4) Fabric type shade canopies that a bear a flame spread rating of Class A (0-25) are not required to be sprinklered.

8.15.8.1.1 NO SPRINKLER DELETIONS IN BATHROOMS *AMENDED*

There shall be no sprinkler deletions in bathrooms.

8.16.1.1.1.1.1 FIRE RISER DETAILS *ADDED*

See City MAG Supplements, Standard Detail Drawings 2367and 2368 or 2369 at: www.scottsdaleaz.gov/design/detaildrawings/sd2300series.asp.

8.16.1.1.2.5 CONTROL VALVE SUPERVISION *ADDED*

When off-site monitoring is not required or provided, the tamper device shall be wired to ring the local water flow bell.

8.16.1.1.2.6 SECTIONAL CONTROL VALVES PER FLOOR *ADDED*

A sprinkler system that serves two or more levels shall incorporate tampered sectional floor control valves.

A mezzanine that covers more than 1/3 of the building footprint shall require separate control valves.

8.16.1.1.7.1 FIRE RISER CLEARANCE *ADDED*

Provide and maintain 12 inch clear in back to walls or any other obstruction, 18 inch clear on each side and 36 inches clear in front of all riser piping, equipment and appurtenances.

(1) Riser assemblies within riser rooms may be provided with alternate double doors or sliding doors that provide a minimum of 36 inches of riser assembly clear working space with doors in the open position.

8.16.1.1.7.2 INTERIOR FIRE RISER LOCATIONS *ADDED*

Interior fire riser locations:

(1) Interior fire risers are to be located a maximum of 3 feet inside of an exterior wall foundation.
(2) May be located in a riser room or,
(3) Installed in a readily accessible (within 25 feet) and visible location from an exterior door,
(4) Risers may be installed in an underground parking garage with prior written approval of the fire code official. When in an underground garage the riser(s) shall be no lower than the first level below grade in the vicinity of (within 25 feet), and clearly visible from a stair or ramp.
(5) Storage, mercantile areas with storage exceeding 12 feet in height, and hazardous uses shall require the riser immediately adjacent (within 5 feet) to an exterior door and secured within a room, or other enclosure as approved by the fire code official.
(6) Depending on hazards there is potential for a dedicated riser room with an exterior door.

8.16.1.1.7.3 EXTERIOR FIRE RISER LOCATIONS *ADDED*

Exterior fire riser locations require approval from the Planning Department if not enclosed in a maintenance yard or other enclosure that shields the riser from view.

8.16.1.1.7.4 MANIFOLD FIRE RISER LOCATIONS *ADDED*

All manifold riser control valves are to be installed in one location.

(1) Other arrangements, such as main supply loops in underground parking garages supplying multiple individual buildings on top, may be allowed with preliminary written approval of the fire code official.

8.16.1.1.7.5 FIRE RISER LOCATION DIRECTIONAL SIGNAGE *ADDED*

In all cases appropriate signage directing responding personnel to the riser location is required. See 8.16.1.1.8.1 for signage requirements.

8.16.1.1.8.1 CONTROL VALVE IDENTIFICATION ***ADDED***

Control valve locations shall be identified with signage of minimum 3 inch high white block letters and ¾ inch stroke on red background.

8.16.4.1.3.1 PROTECTION OF PIPING AGAINST FREEZING ***ADDED***

A minimum of 2" pipe is an acceptable method of freeze protection.

8.17.1.8 FLOW SWITCH MONITORING REQUIREMENTS ***ADDED***

Where off-site monitoring is not required or provided the flow switch shall be wired to ring the electric water flow bell.

8.17.1.8.1 FLOW SWITCH MONITORING MULTIPLE FLOORS ***ADDED***

A sprinkler system that serves two or more levels shall incorporate flow switches per floor.

(1) When a single dwelling unit occupies multiple floors, separate tampered control valves and flow switches may not be required. Written approval from the fire code official shall be obtained for this exception.

8.17.2.3 (4) FIRE DEPARTMENT CONNECTION SIZE ***ADDED***

(4) If fire sprinkler design indicates demand of 1000 GPM or greater, the underground fire department connection line shall be increased to 6" diameter with a three (3) way 2 ½ inch fire department hose connection. See City MAG Supplements, Standard Detail Drawings 2367and 2368 or 2369 at: www.scottsdaleaz.gov/design/detaildrawings/sd2300series.asp.

8.17.2.4.6.1 FIRE DEPARTMENT CONNECTION LOCATIONS ***ADDED***

Fire Department Connections shall be in accordance with Scottsdale Revised Code and located as follows:

(1) Wall mounted Fire Department Connections shall have the bell located above.
(2) Fire Department Connections for H occupancies, as defined in the 2007 IFC shall be located within 150' of a fire hydrant. For all other occupancies the FDC shall be located within 350' of a fire hydrant.
(3) When systems are supplied by a private water main loop, Fire Department Connections shall be located within 350 feet of a fire hydrant, served by a separate public water main system.
(4) Multiple Fire Department Connections supplying a fire sprinkler system shall be located accessible to fire operations staging areas, or at least 40 feet apart.

8.17.2.4.6.2 MULTIPLE FIRE DEPARTMENT CONNECTION REQUIREMENTS ***ADDED***

The fire code official may require multiple Fire Department Connections. Such determinations are made during the building plan review process based on the following conditions:

(1) There is a potential for impairment of one Fire Department Connection such as vehicle congestion, condition of terrain, climatic conditions or other factors that could limit access to a single FDC,
(2) When there are multiple buildings on top of an underground parking garage served by a private fire supply loop,
(3) When fire operation staging areas are required.

8.17.4.6.1.1 BACKFLOW DEVICES *ADDED*

A UL classified, FM listed or ASSE approved vertical backflow preventer (double check backflow preventer assembly) shall be used as the main control valve and as the system check valve when supplied by a public water system. See City MAG Amendments Details (aka City Standard Details) 2368 & 2369.

8.17.4.6.1.2 BACKFLOW ON MULTIPLE FEED FIRELINES *ADDED*

When firelines supply multiple buildings there may be (1) one approved backflow preventer installed in the line above ground exterior of the building, when approved by the Planning Department.

8.17.5.2.1.1 HOSE CONNECTIONS *ADDED*

Hose connections shall be in accordance with Scottsdale Revised Code.

Exterior wall mounted hose valves shall be located a minimum of 5 feet from glazed openings.

CHAPTER 9 – HANGING, BRACING, AND RESTRAINT OF SYSTEM PIPING

9.3.1.1.1 SEISMIC REQUIREMENTS *ADDED*

Unless otherwise provided or exempted by the engineer of record, or when otherwise approved by the building code official, the seismic provisions of NFPA 13 for sprinkler systems will be required when the statement of special inspections includes items of 2006 IBC 1705.3 as elements requiring special inspection. Such determinations are made during the building plan review process.

Seismic requirements may be required, but not necessarily limited to the following examples:

(1) high rise
(2) hospitals
(3) police stations
(4) fire stations
(5) large structures

CHAPTER 11 – DESIGN APPROACHES

11.1.1 ADDITIONAL AUTHORITIES HAVING JURISDICITON *AMENDED*

A building or portion thereof shall be permitted to be protected in accordance with any applicable design basis at the discretion of designer unless specifically addressed by

Scottsdale Revised Codes and/or Standards Interpretations and Applications. Then the specific design basis shall be used unless otherwise approved by the fire code official.

(1) State licensing of institutional and care facilities and the underwriter's fire insurance rating criteria may vary from National Fire Protection Association, City ordinances and Fire Department Interpretations & Applications. The fire code official will accept more stringent design densities, but in no case will the criteria be below NFPA, local codes or department standards. All engineering will be subject to review and approval by the fire department.

(2) Use of materials and appliances should be verified prior to design by insurance underwriter, if applicable. Penalties may occur with some materials.

11.2.3.1.1 (4) ROOM DESIGN METHOD RESTRICTION *ADDED*

(4) The room design method in 11.2.3.1.1 (2) and 11.2.3.3.1 (1) shall only be used with pre-approval from the fire code official.

11.2.3.3.1.1 ROOM DESIGN METHOD RESTRICTION *ADDED*

The room design method shall only be used with pre-approval from the fire code official based on probability that rooms will not be increased in size.

CHAPTER 12 – GENERAL REQUIREMENTS FOR STORAGE

12.1.3.1 UNSPECIFIED STORAGE SHELL DESIGN *ADDED*

Design criteria for unspecified storage areas shall be designed for a ceiling density of .45 gpm / ft² per 3000 ft² at 20 feet measured from 4 feet from bottom of deck.

Use figure 14.2.4.3 to adjust the density up or down based on maximum potential storage height. Other proposals may be considered by the Fire Code Official.

CHAPTER 21 – SPECIAL OCCUPANCY REQUIREMENTS

21.37 LIMITED USE SALES TRAILER DESIGN *ADDED*

Limited use sales trailers (light hazard) may install QR commercial sprinkler heads fed off the domestic supply with a two head flow calculation.

21.38 BUSINESS OCCUPANCIES IN RENOVATED RESIDENTIAL STRUCTURES *ADDED*

Existing R-3 occupancies renovated and re-classified as Group B office occupancy may be equipped with a light hazard commercial sprinkler system utilizing a four head flow calculation.

CHAPTER 22 – PLANS AND CALCULATIONS

22.1.1.1 SUBMITTAL REQUIREMENTS *ADDED*

New construction and remodel plans submitted to the City shall comply with the following:

(1) Submit a minimum of 3 sets of all working drawings.
(2) Submit one set of hydraulic calculations and manufacturer data sheets for all equipment, i.e. sprinkler heads and backflow preventer.
(3) Acceptable paper size shall be limited to 24 x 36 or 30 x 42.
(4) Minimum scale shall be 1/8".
(5) All submittals shall bear a dated review certification and signature of a minimum level III NICET certified engineering technician (CET) automatic sprinkler systems or an Arizona Registered Professional Engineer.
(6) Deviations from approved plans will require approval from the fire code official.

For digital plan submittals; see the City of Scottsdale website at:
http://www.scottsdaleaz.gov/bldgresources/digital.asp

22.1.3 WORKING PLANS (47) THROUGH (58) *ADDED*

(47) A complete site plan including all applicable city notes, the Development Review case number (DR#) and calculation nodes.
(48) One current city approved civil fire line plan shall be submitted for reference.
(49) A current permitted flow test, submitted on the City Flow Test Summary Form is required.
(50) Where systems are supplied by a municipal or private water system, calculation shall maintain a 10% safety margin from the field water pressure test. The slope of the current flow test water supply curve shall be used. Calculated system demand shall not exceed 72 psi.
(51) Phone number of contractor and/or designer on plans with instructions whom to call to pick up plans.
(52) All system shall be reviewed and signed by a minim level III NICET CET Automatic Sprinkler System or an Arizona Registrant knowledgeable in fire protection.
(53) For light steel construction the hangar analysis from a Structural Engineer is required.
(54) When the city has determined that seismic zone requirements apply to a structure, the hangar analysis prepared by the Structural Engineer of record is required.
(55) Owner's Information Certificate.
(56) Registrants Activities Report when required by the professional registrant in charge and/or fire plan review and/or the fire code official – see State law and IBC for deferred submittals. IFC 104.7.2, IBC 106.1, 106.3.4.1.
(57) Technical opinion and report when required by the professional registrant in charge and/or fire plan review and/or the fire code official and/or the building code official – may be required for hazardous conditions. IFC 104.7.2, IBC 106.1, 106.3.4.1.
(58) Professional registrant in charge determination that deferred submittal document is in general conformance to the design of the building, may be required by fire plan review and/or the fire code official. IFC 104, IBC 104, 106.3.4.

22.1.6 TENANT IMPROVEMENT SUBMITTALS *ADDED*

Working plans shall be submitted for approval to the authority having jurisdiction before any equipment is installed or remodeled. See 22.1.1 through 22.1.3.

(1) No submittal is required for adding or relocating 3 heads or less.
(2) Field inspection is required.

22.1.7 FLEXIBLE TUBING TENANT IMPROVEMENT SUBMITTALS *ADDED*

The use of flexible tubing product for tenant improvements will be allowed only when the following guidelines are met:

(1) Drawings are required anytime this product is utilized.
(2) Hydraulic calculations are required if the product friction loss is greater than the existing pipe.
(3) Manufacturer's data sheet required with submittal.

22.4.4.7 (11) FLOW SWITCH LOSS *ADDED*

(11) Pipe sizes 2" or less shall include 3 PSI fixed loss for the flow switch, or per manufacturer specifications.

22.5 PIPE SCHEDULE PROHIBITED *AMENDED*

The pipe schedule method shall not be permitted for use in any occupancy for new sprinkler systems, existing systems or extensions to existing systems.

23.1.6.2.1 CONNECTION PASSING THROUGH OR UNDER FOUNDATION WALLS *ADDED*

All firelines entering a building must enter the building as close as possible to within 36 inches to the inside face of an exterior wall.

The bottom of the pipe flange shall terminate a minimum of 6" above the finished floor.

23.2.6 LISTED UNDERGROUND PIPING *ADDED*

All fire line piping, off-site and on-site, shall be listed for fire protection service and installed per NFPA 24, City of Scottsdale Design Standards and Policy Manual http://www.scottsdaleaz.gov/design/dspm.asp

24.2.1.5.1 COMMERCIAL TENANT IMPROVEMENT PRESSURE TESTING *ADDED*

When the installing contractor does not elect to isolate the new portion then the entire system shall be tested at not less than 150 psi for 2 hours.

24.2.1.6.1 TESTING NEW DROPS *ADDED*

Modifications affecting more than 20 new drops shall be pressure tested at not less than 150 psi for 2 hours.

24.7 CPVC CERTIFICATION CARD REQUIREMENT *ADDED*

Installation of CPVC pipe requires the factory issued certification card to be carried by the pipe fitter during installation and is to be made available to an inspector upon request. The installer shall follow all manufacturer guidelines for installation.

26.2 RE-INSPECTION FEES & CANCELLATIONS *ADDED*

A re-inspection fee will be assessed for each re-inspection, not necessarily limited to the following**:**

(1) When installation is not complete.
(2) When corrections from previous inspection are not complete.
(3) When two or more appointments have been cancelled at the same address.
(4) Late notice of cancellation. (less than 2 hrs prior)

26.3 CANCELLATION CALLS TO SCHEDULER *ADDED*

Cancellation calls shall be made to scheduler, not inspectors.